

APPENDIX H

Installing an Auto Call Facility on a UNIX™ System

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A. INTRODUCTION

You should be thoroughly familiar with the procedures and commands used to install a UNIX¹ system and should have read *Setting up UNIX* before using this memorandum.

The UNIX Time-Sharing System can use a Bell System 801-type Auto Call Unit (ACU) for dialing-up and communicating with other systems. The user-level interface to the ACU is via the *cu* and *uucp* commands. (See *cu(1C)* and *uucp(1C)* in the *UNIX System User's Manual*.) Before ACUs can be used, however, a system administrator must first make certain software adjustments to the system. These adjustments are listed below.

B. PROCEDURES

The following procedures should ensure a properly software-installed automatic call-up facility. If you are installing more than one facility, adjust the instructions accordingly. These instructions apply to DEC UNIX systems and to 3B20 Simplex UNIX systems of Release 5.0 or later. The instructions are divided into a section that applies to both systems, a section on DEC UNIX systems, and a section on 3B20 Simplex UNIX systems.

B.1 Common Procedures

You must have an 801-type ACU and a modem per facility (except as noted below for Bell System 57A1 and 57B1 data units for shared-ACU setups).

1. The ACU must first be optioned correctly, as described below, and associated with a dedicated terminal phone line. For the following examples, */dev/tty00* will be the dedicated line.

The 801-type ACU contains the following switches and should be optioned as shown below. A **0**=open and a **1**=closed. (On a closed switch, the side next to the number is down.) Bracketed switches are missing on some models.

```
S1 - 1000[1]
S2 - 0101
S3 - 11010
S4 - 11[00]
```

If you are using 212-type data sets, make sure they are optioned as follows.

```
S1 - [0]001
S2 - 110001100
S3 - 11110000
S5 - 00
```

The 57A1 and 57B1 data units are Western Electric devices that allow an ACU to be shared by up to 12 terminal phone lines (data sets). With one 57A1 and one 57B1, a single ACU can dial out on up to six phone lines in one data mounting. With two 57A1s and two 57B1s, a single ACU can dial out on up to twelve phone lines in two data mountings.

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If you are using the shared-ACU facility, the 57B1 data unit will have to be properly optioned. If the 57B1 data unit is the only sharing circuit in an arrangement, or the first one in an arrangement using two data mountings, all the positions of switches *S9* and *S10* must be open. If the 57B1 is the second sharing circuit in an arrangement using two data mountings, all positions of switches *S9* and *S10* must be closed. If you are using two data mountings, the T and R terminals of TS1 on the two 57A1s must be connected. (See reference 1.) There are no customer-selected options.

2. All make-busy (MB) and service-line (SL) switches on the data mountings should be in the up or off position (i.e., don't busy them out). The make-busy switches on the 57B1s should be in the off position for the slots that have data sets, and in the make-busy position for unequipped or unused slots. Please note the special instructions in *UNIX System Administrator's Guide* when using 103J-type, 113C-type and 113D-type data sets with an 801-type ACU.

If you have a 212A data set and wish to use it at high speed, the high speed button must be pressed in. This is *not* software switchable. If you choose high speed, any UNIX system you call must have 1200 baud answer capability or you will not be able to connect.

3. Edit `/etc/inittab` and turn the *getty* process *off* for multi-user state (e.g., state 2) by changing the flags field to *off*:

```
00:2:off:/etc/getty tty00 1200 #
```

4. After you complete the steps in one of the following two sections for your hardware, make a new operating system, install it as `/unix` and reboot.

B.2 DEC UNIX Systems

1. You must have a DEC ACU interface, a DN-11 line card. The line card should be optioned for EIA by your DEC Customer Engineer.
2. Include the ACU interface device driver entry in your system description file with the appropriate information for your unit; for example:

```
dn11 370 175200 4 1
```

3. Take note of the major device number generated by `config -t`. It will usually be a 7 on VAX systems and a 4 on PDP-11 UNIX systems. Using the major device number, make the following device entries in the `/dev` directory. The name `dn0` is commonly used with DEC UNIX systems.

```
# mknod /dev/dn0 c 7 0
# ln /dev/dn0 /dev/cua0
# ln /dev/tty00 /dev/cul0
```

The linked names of `cul0` and `cua0` are simply aliases of the access and line devices that are known by the *cu* and *uucp* commands.

In shared-ACU configurations that use two mounting racks, the data sets are numbered 1 through 6 in the first rack and 9 through 14 in the second rack. The data set number should be reflected in the high-order 4 bits of the minor device number of the ACU interface device entries in `/dev`.

As a comparison, to install four ACU facilities on a UNIX System on a DEC processor would have previously required 4 DN-11 line cards, 4 801-type ACUs, 4 data sets and the following nodes:

<i>Entry</i>	<i>Minor Device #</i>
/dev/dn0	0
/dev/dn1	1
/dev/dn2	2
/dev/dn3	3

With the shared-ACU facility, only 1 DN-11 line card and 1 ACU is required. Up to 12 data sets can be serviced and their nodes would be:

<i>Entry</i>	<i>Minor Device #</i>
/dev/dn0	020 (16)
/dev/dn1	040 (32)
/dev/dn2	060 (48)
/dev/dn3	0100 (64)
/dev/dn4	0120 (80)
/dev/dn5	0140 (96)
/dev/dn6	0220 (144)
/dev/dn7	0240 (160)
/dev/dn8	0260 (176)
/dev/dn9	0300 (192)
/dev/dn10	0320 (208)
/dev/dn11	0340 (224)

For more information, see References 1 and 2.

4. Change the modes on the two devices to read/write by all.

```
# chmod 666 /dev/cua0 /dev/cul0
```

Note that the modes of the aliases of **cul0** and **cua0** are changed automatically because they are links.

5. Ensure that an appropriate entry exists in the file **/usr/lib/uucp/L-devices**.

```
ACU cul0 cua0 300
```

If you have chosen the high speed switch on the 212A data set, this line should have the speed **1200** instead of **300**.

Note: The above are only examples and should not necessarily be copied directly for your system.

B.3 3B20 Simplex UNIX Systems

1. You must have a 3B20S ACU interface: a TN75B (1-line) or a UN56 (8-line) circuit pack.
2. Specify the interface in the **/etc/system** file. For instance, if you have a UN56 in slot 7 of iop 1, the **/etc/system** file would contain:

```
iop 1    ...
      :
      :
      un56 0 7 0 0 0 0
```

3. Make an entry in the **/dev** directory for each dial-out line. The name **acu** is usually used on 3B20 UNIX systems. The major device numbers are 15 for the TN75B and 25 for the UN56. The following commands make 4 dial-out lines for a UN56.

```
# mknod /dev/acu0 c 25 0
# mknod /dev/acu1 c 25 1
# mknod /dev/acu2 c 25 2
# mknod /dev/acu3 c 25 3
```

4. Change the modes of the device entries to write by all.

```
# chmod 222 /dev/acu[0-3]
```

5. Make sure that the appropriate entries exist in the file `/usr/lib/uucp/L-devices`. For example, if the 4 dial-out lines are associated with terminal devices 50 through 53, the entries would be:

```
ACU tty50 acu0 1200
ACU tty51 acu1 1200
ACU tty52 acu2 1200
ACU tty53 acu3 300
```

The last column specifies baud rates. These should be 1200 if the high-speed switch on the data set is depressed, 300 if not.

6. Make sure that the modes of the terminal lines are read/write by all:

```
# chmod 666 /dev/tty5[0-3]
```

7. If you are using a UN56, create a file that specifies the ACU configuration to the UN56. This file is used by the `acuset(1M)` command to initialize the UN56. The file is made up of lines of the form:

```
/dev/acu? unit port [slot]
```

where `/dev/acu?` is a device node as created above, `unit` is the UN56 unit number, `port` is the port on that unit (marked on the distribution panel), and `slot` is the slot number in a sharing arrangement (1-6 for the first data mounting, 7-12 for the second). A non-shared ACU does not have a slot number. For example, the following file specifies that the four devices created above are attached to UN56 unit 0. The first two are in slots 1 and 2 in a sharing arrangement on port 0; the third is in a non-shared arrangement on port 1, and the fourth is non-shared on port 2.

```
/dev/acu0 0 0 1
/dev/acu1 0 0 2
/dev/acu2 0 1
/dev/acu3 0 2
```

See the `acuset(1M)` manual entry for more information.

8. The UN56 will not work unless it is initialized. Change the `/etc/rc` file to call the `acuset` command with the configuration file created above to initialize the UN56. For example, if the file is named `acus`, add the line

```
/etc/acuset acus
```

to the `/etc/rc` file.

C. DIAGNOSING PROBLEMS

If the above steps are followed precisely and the unit still does not work, the hardware should be checked out. Problems should be diagnosed in the following order:

1. ensure that the lock file (`/usr/spool/uucp/LCK...`) is not present from earlier failed attempts with `cu` or `uucp`,
2. perform the self-tests on the data sets, the ACUs, and the sharing hardware (these tests are described in literature that comes with the devices),

3. verify that both the ACU and the data set are correctly optioned as described above,
4. check that the ACU interface device (UN56, TN75B, or DN-11) is pulsing digits to the ACU,
5. determine that the ACU is dialing the *correct* digits,
6. ensure the integrity of the data set by using it as a dial-in port, and
7. determine that the cable leads are not defective.

D. REFERENCES

- [1] *UNIX™ System User's Manual - System V.*
- [2] *UNIX™ System Administrator's Manual - System V.*